REMARKS

Claims 1-6 are now in this Application, and are presented for the Examiner's consideration.

Telephone Interview

The undersigned would like to thank the Examiner for the courteous telephone interview afforded the undersigned on February 14, 2006. No understanding as to allowability was reached. However, in view of the Examiner's helpful comments during the interview, the claims have now been amended in a different manner to structurally distinguish over the prior art, as will be discussed in more detail below.

Rejection of Claims under 35 U.S.C. §112

Claims 1-6 were rejected under 35 U.S.C. §112, first paragraph, as being indefinite, on the basis that there is no support for the newly claimed limitation that the change of direction is by an angular amount substantially less than 90 degrees.

Although it is submitted that one skilled in the art would clearly appreciate from Fig. 3 of the present application that the change in direction of fixing roller R1 is substantially less than 90 degrees (the measured change in direction is shown as 25 degrees), the objected to language has been deleted from claim 1

in order to advance prosecution.

Accordingly, it is respectfully submitted that the rejection of claims 1-6 under 35 U.S.C. §112 has been overcome.

Prior Art

Although the claims were not rejected on the basis of prior art in this final Office Action, the claims have been amended to more clearly distinguish over the prior art applied during the previous Office Action.

Specifically, claim 1 has been amended to recite the following structural limitations:

a) a roller arrangement to adjust a curvature of the optical fiber by an adjusted curvature radius. The roller arrangement is shown in Fig. 3 as comprising fixing roller 17 and moving rollers 18 and 19 which adjust the curvature to an adjusted curvature radius R2 which is a gradual curvature, as distinguish from a conventional 90 degrees curvature over a small radius.

b) the roller arrangement includes a fixing roller (17) immediately following the optical fiber standard value controller unit and adapted to change a drawing direction of the optical fiber by a curvature radius (R1) which is less than the adjusted curvature radius (R2). See page 9, lines 5-8 of the present application for support. Clearly radius R1 is much less than adjusted curvature radius R2.

c) at least two moving rollers (18, 19) immediately following the fixing roller (17) and on a same side of the optical fiber as the fixing roller (17). Fig. 3 clearly shows moving rollers (18, 19) on the same side of the optical fiber as the fixing roller (17) and following the fixing roller (17).

d) the at least two moving rollers having axial centers which are movable to different positions on a drawing surface for gradually adjusting the adjusted curvature radius R2 of the optical fiber which has a changed drawing direction in order to release bending stress and stress concentration in the optical fiber and thereby decrease a possibility of breakage of the optical fiber. The rollers (18, 19) have axial centers that are movable in the horizontal and vertical directions as shown by the arrows in Fig. 3 associated with each roller and as disclosed at page 9, line 15 et seq.

Because of this arrangement, the optical fiber drawing apparatus according to the present invention is capable of minimizing breakage of an optical fiber by adjusting the curvature radius of an optical fiber to an adjusted curvature radius R2. This is accomplished by using at least two moving rollers on the same side of the optical fiber as the fixing roller to release a bending stress and stress concentration, thereby decreasing the possibility of breakage of the optical fiber by adjusting the optical fiber curvature radius R2. In

other words, the present invention adjusts the optical fiber curvature radius R2 by using moving rollers so as to not sharply change the optical fiber direction, but rather, to gradually change the direction, as shown in Fig. 3 of the present application.

Now, with respect to the previously applied prior art, PCT Published Patent Application No. WO 00/44680 to Yoshida et al (and corresponding U.S. Patent No. 6,519,404 to Yoshida et al) has no relation to adjusting an optical fiber curvature radius by using moving rollers so as not to sharply change the optical fiber direction, but rather, Yoshida et al merely relates to canceling out the elastic torsion of the coated optical fiber in the longitudinal direction.

As clearly shown in Yoshida et al, there is no gradual change in curvature accomplished by at least one or more moving rollers. Rather, all of the changes in direction accomplished with movable rollers are sharp changes in direction.

With the above objects and effects in mind, it will be appreciated that the construction of the present invention, as now recited in amended claim 1, is very different from that of Yoshida et al.

First, with respect to Fig. 2 of Yoshida et al, although there are two moving rollers 4, 5, they are positioned on opposite sides of the optical fiber from the fixing roller 3,

contrary to the recitation in claim 1 that all of the rollers are on the same side of the optical fiber. Because of this structural distinction, Yoshida et al does not provide a gradual change in the adjusted radius of curvature. Rather, because fixing roller 3 is on a different side of the optical fiber from rollers 4, 5, roller 3 provides a sharp turning angle (almost 90 degrees), as do rollers 4, 5, which is contrary to the objective of the present invention to reduce the bending stress.

Claim 1 of the present application is distinguished even more from Fig. 3 of Yoshida et al (which also corresponds to Fig. 1a of Yoshida). Specifically, in Fig. 3 of Yoshida et al, there is only one moving roller 23 and one fixing roller 24 on the same side of the optical fiber. Rollers 22 do not count as fixing rollers, as claimed, since they do not change the direction of the optical fiber, but rather, merely act as guide rollers that provide no change in direction of the optical fiber.

Because of the arrangement in Fig. 3 of Yoshida et al, the optical fiber must turn through two sharp 90 degree angles. This, then, is effectively the same as the prior art deficiencies noted in the present application where the tension force and bending stress are great, resulting in local bending that can cause cracks or breaks in the optical fiber.

Further, it is noted that the axial center of moving roller 23 is not movable, but rather, the axial center of roller 23

remains the same, since the axis of roller 23 is only angularly changed, but not vertically or horizontally displaced.

Thus, amended claim 1 distinguishes from Yoshida et al by the following limitations:

a) a fixing roller immediately following the optical fiber standard value controller unit. The fixing roller 24 follows moving roller 23, which is the opposite of the present claimed invention.

b) at least two moving rollers immediately following the fixing roller. In Fig. 3, there is only one fixing roller and it follows the moving roller, rather than the claimed opposite arrangement.

c) there are at least two moving rollers and a fixing roller on the same side of said optical fiber, that is, there are at least three rollers in total on the same side of the optical fiber.

d) the at least two moving rollers have axial centers which are movable to different positions on a drawing surface for gradually adjusting the adjusted curvature radius of the optical fiber which has a changed drawing direction in order to release bending stress and stress concentration in the optical fiber and thereby decrease a possibility of breakage of the optical fiber. In Fig. 3 of Yoshida et al, as discussed above, there is only one moving roller 23 which is angularly variable, but in which the

axial centers do not move to different positions for releasing bending stress and stress concentration.

Thus, the construction of the present claimed invention, as now recited in claim 1, is quite different from that of Yoshida et al.

As to the remaining references previously applied against claims 1-6, namely, U.S. Patent No. 4,410,344 to Iyengar, Japanese Patent Publication No. JP 04-361205 to Komiya et al, U.S. Patent No. 6,324,872 to Blaszyk et al, Butterworth-Heinemann (Dictionary of Engineering Terms) and Sclater et al (Mechanisms & Mechanical Devices Sourcebook, 2001), the following comments are made.

Iyengar was merely cited for disclosing that a bracket is typically used to connect a roller to a device. Japanese Patent Publication No. JP 04-361205 was merely cited for disclosing a movable roller device 9 connected to a bracket such as a base plate 7. A single roller is shown. Blaszyk et al was merely cited for disclosing brackets, such as base plates 141 and 142, or yokes 250 and 281, to show that it is known to attach a shaft to a rolling device such as a pulley or a roller. Butterworth-Heinemann was merely cited for disclosing a CAM that can be used to impart motion on a mating component. Sclater et al was merely cited for disclosing a roller device with a groove in a bracket.

However, none of these references cure any of the deficiencies of Yoshida et al, as discussed above.

Thus, there is no disclosure or even a remote suggestion of the combination of:

a) a fixing roller immediately following the optical fiber standard value controller unit,

b) at least two moving rollers immediately following the fixing roller,

c) the at least two moving rollers and the fixing roller on the same side of the optical fiber so that there are at least three rollers in total on the same side of the optical fiber, and

d) the at least two moving rollers having axial centers which are movable to different positions on a drawing surface for gradually adjusting the adjusted curvature radius of the optical fiber which has a changed drawing direction in order to release bending stress and stress concentration in the optical fiber and thereby decrease a possibility of breakage of the optical fiber.

Therefore, even if these references are combined with Yoshida et al, the invention of amended claim 1 would still not be disclosed, or even remotely suggested, by such combination.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt

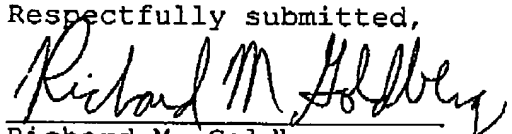
action.

In the event that this Paper is late filed, and the necessary petition for extension of time is not filed concurrently herewith, please consider this as a Petition for the requisite extension of time, and to the extent not tendered by check attached hereto, authorization to charge the extension fee, or any other fee required in connection with this Paper, to Account No. 07-1524.

The Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 07-1524.

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 1-6 are allowable, and early and favorable consideration thereof is solicited.

Respectfully submitted,



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